# AN AMMONOID FROM THE PERMIAN OF QUEENSLAND

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ABSTRACT

*Uraloceras cancellatum* sp. nov. is described from the Yarrol Formation in the Yarrol Basin near Cania. This species, the first ammonoid described from the Permian of Queensland, has affinities with forms from the Ural Mountains, which suggest a probable lower Artinskian age.

Ammonoids, which are a key group in the intercontinental correlation of Upper Palaeozoic sediments, have not been described previously from the Permian of Queensland. Etheridge Jr. (1880, 1892) described from the "Permo-Carboniferous system" of Queensland several species that he referred to the ammonoid genus *Goniatites* de Haan, but examination of the relevant specimens in the Geological Survey of Queensland collections has shown that only four are of Permian age and all four are gastropods. The discovery therefore, in the Lower Permian of the Yarrol Basin, of an ammonoid with well preserved suture lines is significant in the correlation of the Queensland Permian with overseas successions.

The single ammonoid was collected during regional mapping of the Monto 1 : 250,000 sheet area by the Geological Survey of Queensland, from the basal beds of the Yarrol Formation in a tributary of Spring Creek, 6 miles east-south-east of Cania. A rich brachiopod assemblage with the ammonoid includes *Strophalosia preovalis* Maxwell, *Linoproductus* cf. *lyoni* Prendergast, *Anidanthus springsurensis* (Booker), *Cancrinella* cf. *farleyensis* (Eth. and Dun), *Terrakea* sp., *Lissochonetes yarrolensis* Maxwell, *Ingelarella profunda* Campbell, and *Grantonia* cf. *hobartensis* Brown. It is similar to the brachiopod fauna from the Yarrol Formation at Yarrol Station, which was regarded by Maxwell (1964) as upper Sakmarian.

Some of the brachiopods that were figured by Etheridge Jr. (1892) came from the Yarrol Formation in Spring Creek, not far from the ammonoid locality.

Other cephalopods collected in Spring Creek during the regional mapping include an indeterminate ammonoid fragment higher in the Yarrol Formation, and a straight nautiloid from the overlying Owl Gully Volcanics.

The Burnett Formation which underlies the Yarrol Formation is dominantly terrestrial in the Cania area, where it is disconformable on the Lower Carboniferous.

## Family **PARAGASTRIOCERATIDAE** Ruzhencev, 1951

### Genus **URALOCERAS** Ruzhencev, 1936

### **URALOCERAS CANCELLATUM** sp. nov.

(Plate 25, figures 1–4)

MATERIAL.—Holotype, F.9060a, b, c, Geological Survey Collection; from locality D158, in tributary of Spring Creek, 100 yards south-east of bridge on the road between Monto and Clonmel homestead; Portion 37, Parish of Clonmel, County of Yarrol. Specimen consists of part of flank of body chamber and approximately one-third of a mature whorl of the phragmocone.

DIAGNOSIS.—Conch large, subdiscoidal, evolute; internal mould strongly lirate, with growth lines on dorso-lateral flanks; suture with ventral prongs and lateral lobes of equal width, and with constrictions of first lateral saddle.

DESCRIPTION.—Conch large, evolute, and subdiscoidal, with wide umbilicus; maximum diameter in excess of 70 mm; flanks gently convex; venter subangular, but partly flattened by external pressure; umbilical shoulder rounded, and umbilical wall short and steep; dimensions of chamber near adoral end of phragmocone—height 30 mm, width 15 mm.

Test thin-shelled, strongly lirate, with lirae strongly impressed on internal mould; lirae 10–12 per 10 mm on ventro-lateral flanks of outer whorls, slightly finer on dorso-lateral flanks; lirae on internal mould as strongly impressed on dorso-lateral flanks as on venter; intervening furrows of same width as lirae; fine transverse striae form shallow sinus on dorso-lateral flanks of internal mould but do not persist ventrally; transverse ornament obliterated on external mould; nodes not developed; constrictions absent in that portion of shell preserved; ornament of innermost whorls unknown.

External suture of five primary lobes and six primary saddles; ventral lobe broad, divided by large ventral saddle; lateral lobes and prongs of ventral lobe of same width, and shaped like ogee arches (pl. 25, fig. 3); first lateral saddle constricted on both sides near base; faint lobation developed on ventral side of pointed umbilical lobe; suture lines broader on lobes than on saddles because of lower inclination of septa to shell surface; internal suture unknown.

REMARKS.—The subdiscoidal, widely umbilicate conch and the diagnostic suture indicate reference of this species to *Uraloceras*, within the Paragastrioceratidae, a family of lirate gastrioceratids which ranges almost throughout the entire Permian. Apart from occurrences in New South Wales and Western Australia, *Uraloceras* is virtually restricted to the Ural Mountains region, where it first appears in the upper Sakmarian (upper part of Tastubian horizon of Ruzhencev (1952)), and ranges into the upper Artinskian (Baigendzhinian substage of Ruzhencev (1956)).

Glenister and Furnish (1961) have discussed adequately the relationships between *Uraloceras* and the closely related genera *Paragastrioceras* Tchernow and *Pseudogastrioceras* Spath. Essentially, *Paragastrioceras* and *Uraloceras* have a finely lirate, narrowly umbilicate conch, and a ventral salient of the apertural margin, whereas *Pseudogastrioceras* has a coarsely lirate, narrowly umbilicate conch, and a rounded hyponymic sinus. *Uraloceras* is distinguished from *Paragastrioceras* by

its comparatively poorly developed nodes, and by its sutures in which the ventral prongs and lateral lobes are of equal width. In both *Paragastrioceras* and *Pseudogastrioceras*, the prongs of the ventral lobe are usually conspicuously narrower than the lateral lobes. *Uraloceras* and *Paragastrioceras* are restricted to the Sakmarian and Artinskian, and *Pseudogastrioceras* does not range below the upper Artinskian.

*Uraloceras cancellatum* compares closely with several species from the upper Sakmarian and lower Artinskian (Aktastinian substage of Ruzhencev (1956)) of the Ural Mountains. The greatest similarity is with larger specimens of *U. complanatum* (Voinova), figured by Ruzhencev (1956, pl. 25, figs. 5, 6) from the Aktastinian substage. This Russian species has a marked constriction of the first lateral saddle and a very faint lobation on the ventral side of the umbilical lobe (Ruzhencev, 1956, text-fig. 62), but is smooth on the internal mould and has scattered constrictions. The young growth stages of *U. complanatum* show prominent transverse ribbing which is absent in the more mature whorls.

Another closely comparable species from the Aktastinian of the Urals is *U. fedorowi* (Karpinsky), as figured by Ruzhencev (1956, pl. 26, figs. 1a, b). Lirae of similar density to those on *U. cancellatum* show on the internal mould, and ribs are absent in the mature whorls. The suture of *U. fedorowi* shows a slight lobation on the ventral side of the umbilical lobe, but lacks the constrictions of the first lateral saddle.

*U. limatulum* Ruzhencev (1938, pl. 5, figs. 11–15; 1951, pl. 13, figs. 5–7) from the Sterlitamakian horizon (upper Sakmarian) of the southern Urals has affinities with *U. cancellatum*, but can be distinguished by its smaller size, smooth internal mould, finer lirate ornament, shallower umbilical lobe, and absence of constrictions on the first lateral saddle.

*U. pokolbinense* (Teichert), one of the two ammonoid species described from the Permian of New South Wales, has resemblances to *U. cancellatum* in the sutures. It differs in its less compressed, more evolute shell, and in the presence of scattered constrictions. Apart from poorly impressed traces of lirae on the body chamber, the internal mould of *U. pokolbinense* is smooth. Figures of the suture line of *U. pokolbinense* by Teichert (1954, pl. 7, figs. 1–3, text-fig. 2) show that the constrictions of the first lateral saddle and the lobation on the ventral side of the umbilical lobe are less pronounced than in *U. cancellatum*. *U. pokolbinense* was included originally by Teichert (1954) in *Pseudogastrioceras*, but was subsequently assigned to *Uraloceras* by Glenister and Furnish (1961), on the basis of its diagnostic suture line. Because of the development of a biconvex constriction in the paratype, *U. pokolbinense* was considered by Glenister and Furnish (1961) to be " somewhat transitional " between *Uraloceras* and *Pseudogastrioceras*, in the nature of the apertural margin. *U. pokolbinense* comes from the Farley Formation, the age of which is considered to be late Sakmarian or early Artinskian (Glenister and Furnish, 1961).

*Uraloceras irvinense* Teichert and Glenister (1952, pl. 4, figs. 2–7) from the Sakmarian Holmwood Shale of the Perth Basin is a small form which does not closely resemble *U. cancellatum*.

From the base of the Middle Bowen Beds at Mt. Britton in the northern Bowen Basin, Whitehouse (1925) identified a paragastrioceratid that he referred to *Girtyites* Wedekind, a junior synonym of *Paragastrioceras*. The specimen could not be located for examination. An unlabelled external mould of a probable paragastrioceratid in the Geological Survey of Queensland collection is preserved in a reddish brown matrix similar to that at Mt. Britton, but is not the specimen identified by Whitehouse (F. W. Whitehouse, pers. comm.). The Geological Survey specimen is strongly ribbed and coarsely lirate, and does not resemble *Uraloceras cancellatum*.

In conclusion, the closest affinities of *U. cancellatum* are with lower Artinskian species from the Ural Mountains and with *U. pokolbinense* from the Farley Formation in New South Wales.

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## EXPLANATION OF PLATE XXV

All figures natural size

*Uraloceras cancellatum* sp. nov.

Fig. 1. Lateral view of holotype, F.9060a, b, c (G.S.Q.), showing internal mould of part of phragmocone and body chamber.

Fig. 2. Ventral view of internal mould of phragmocone of holotype, F.9060a (G.S.Q.), showing depressed shell.

Fig. 3. Lateral view of same, showing suture line, lirae, and growth lines.

Fig. 4. Suture line of same.